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INTELLIGENT ALARMING

W. B. Braden

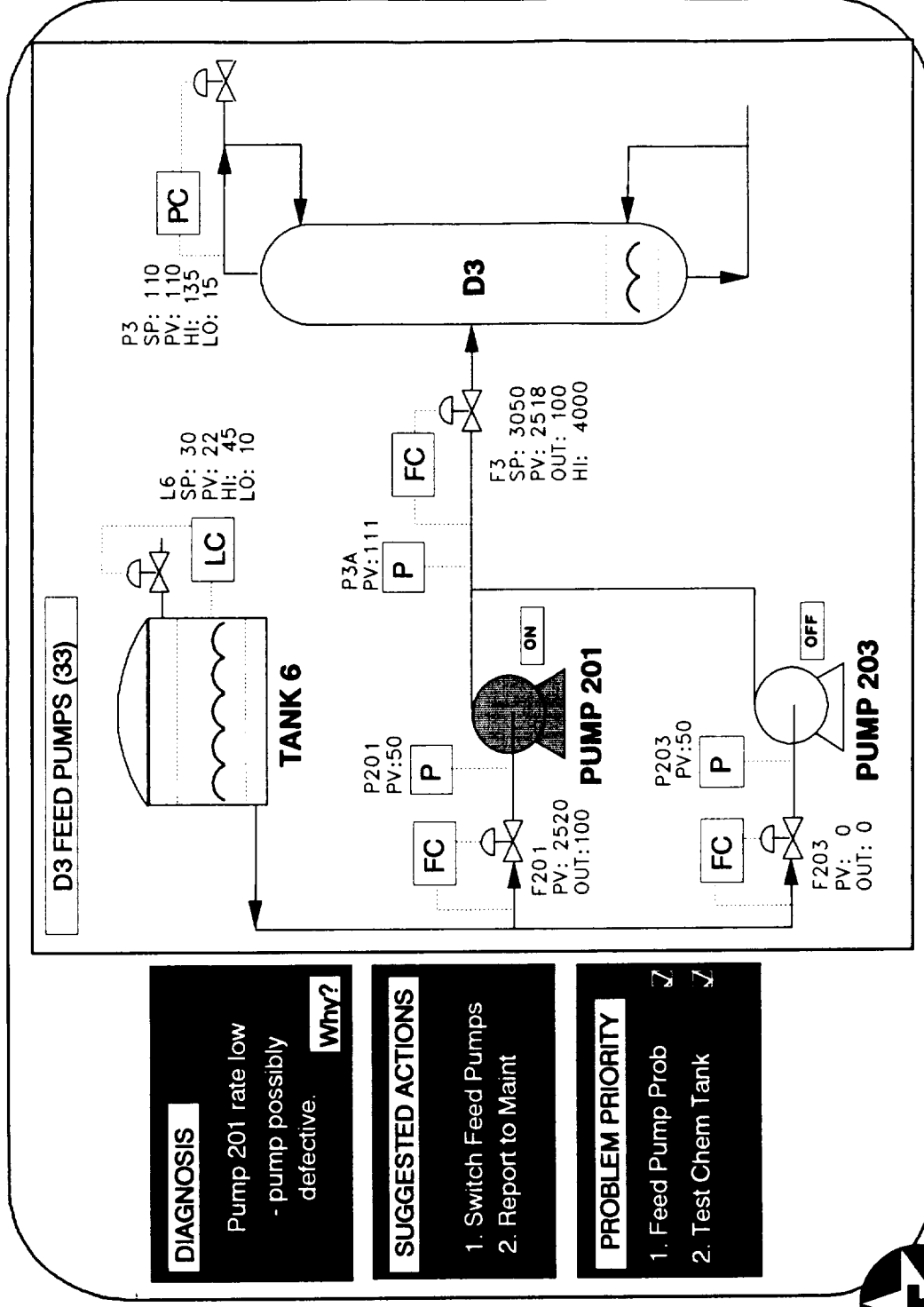
ABSTRACT

This talk discusses the importance of providing a process operator with concise information about a process fault including a root cause diagnosis of the problem, a suggested best action for correcting the fault, and prioritization of the problem set. A decision tree approach is used to illustrate one type of approach for determining the root cause of a problem. Fault detection in several different types of scenarios is addressed including pump malfunctions and pipeline leaks. The talk stresses the need for a good data rectification strategy and good process models along with a method for presenting the findings to the process operator in a focused and understandable way. A real-time expert system is discussed as an effective tool to help provide operators with this type of information. The use of expert systems in the analysis of actual vs predicted results from neural networks and other types of process models is discussed.

BIOGRAPHY

Bill Braden is a senior technologist in the Advanced Technology Group of Texaco's Information Technology Department, located in Houston, TX. His present focus is on the use of artificial intelligence in the areas of process alarming and control. Prior work involved chemicals research, fuels research, and tertiary oil recovery research.

Focused Advice



DIAGNOSIS

Pump 201 rate low
- pump possibly defective.

Why?

SUGGESTED ACTIONS

1. Switch Feed Pumps
2. Report to Maint

PROBLEM PRIORITY

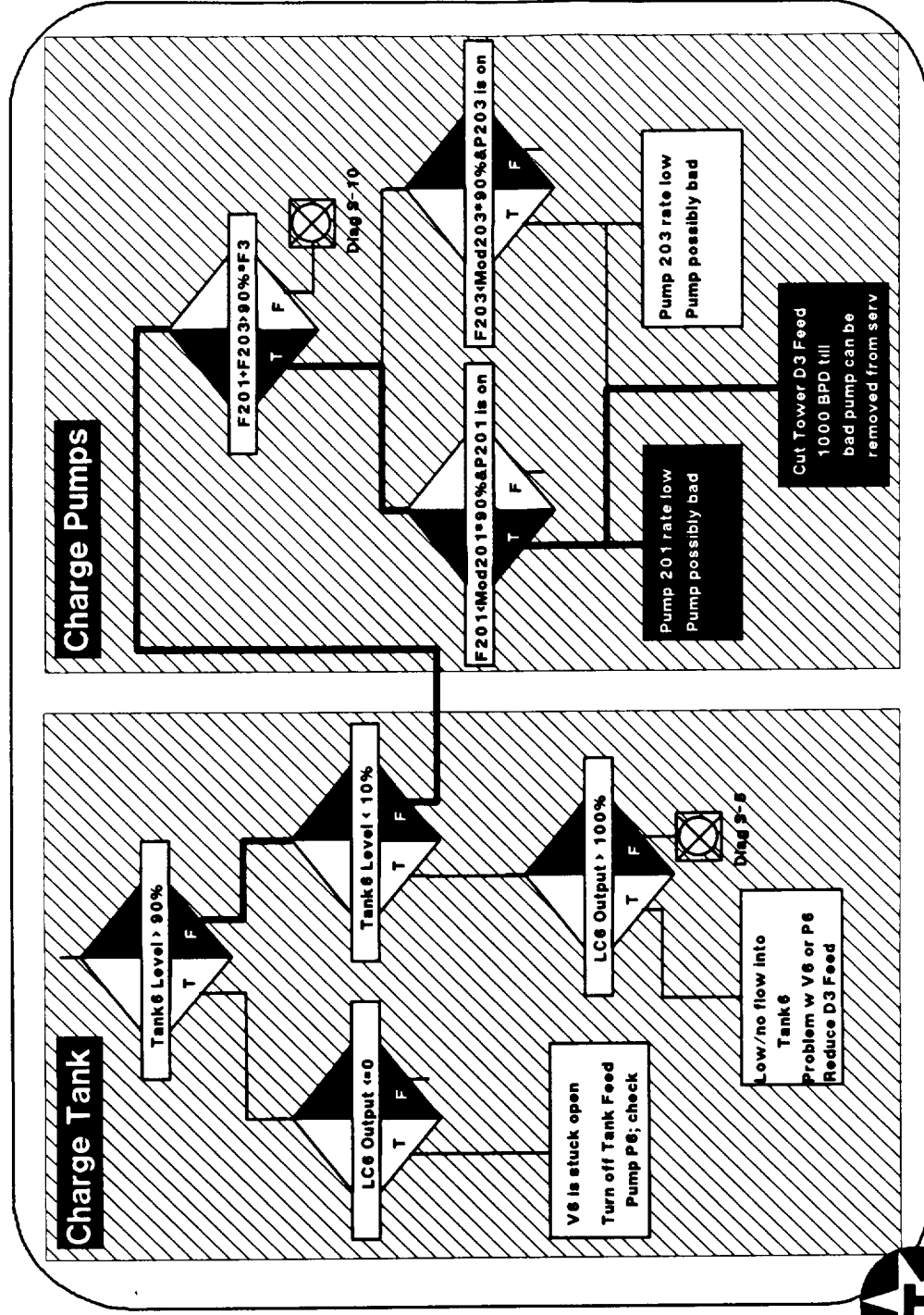
1. Feed Pump Prob ✓
2. Test Chem Tank ✓



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Decision Tree

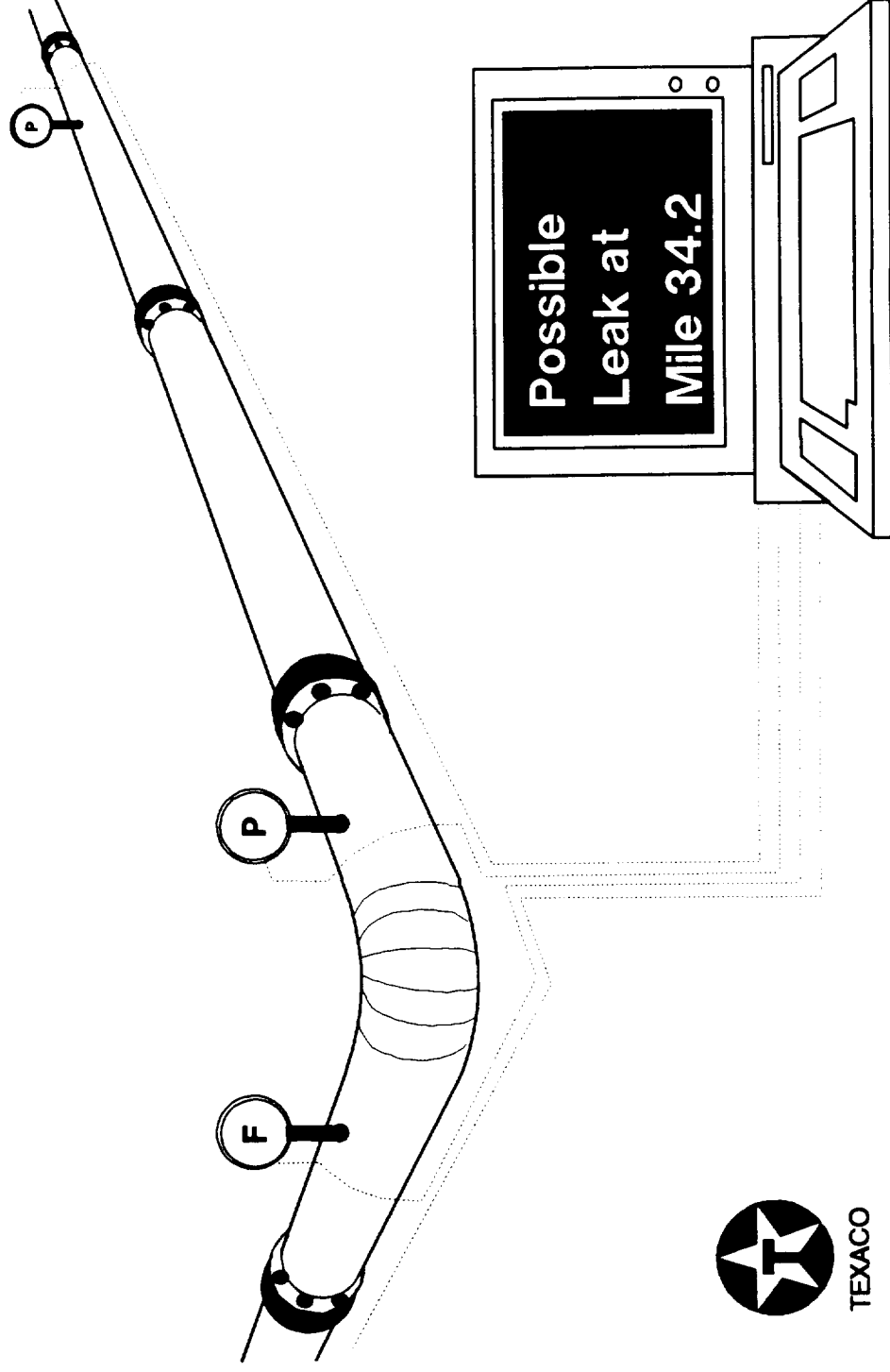


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Neural Network Leak Detection

Safeguarding the Environment

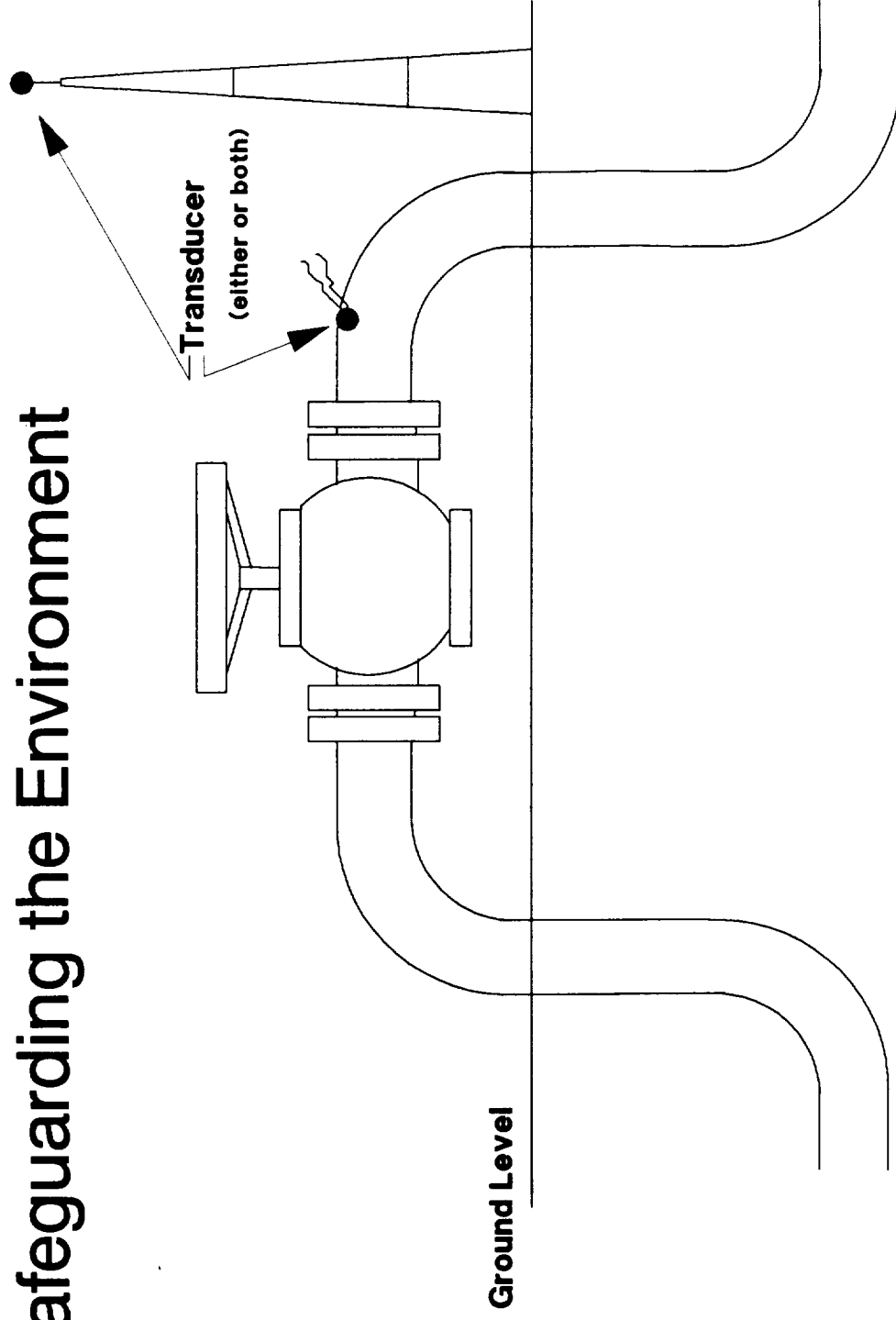


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Sonic Leak Detection

Safeguarding the Environment



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